REMARKS

Status of the Claims

Claims 7-18 remain pending in the application. Please amend claims 7, 11-14. Claims 19-21 have been added. Claims 1-6 have been canceled without prejudice.

Drawing Objections

The office action states "[t]he drawings have been objected to because Figures 5 and 6 should be designated by a legend such as --Prior Art-- because only that which is old illustrated." Applicants disagree with the Examiner's assertion that Figures 5 and 6 illustrate prior art. Applicants do not consider the information illustrated in Figures 5 and 6 prior art. Applicants respectfully request the above drawing objection to be removed.

Office Action Rejections Summary

Claims 2, 3, 12, and 13 have been rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement. Claims 1, 4, 6, 9, and 10 have been rejected under 35 U.S.C. § 102(e) as being anticipated by Drew. Claim 11 has been rejected under 35 U.S.C. § 102(e) as being anticipated by Shenoi et al. Claims 12, 17, and 18 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Shenoi et al in view of Drew. Claims 2, 3, 5, 7, and 8 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Drew. Claims 13-16 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Shenoi et al. in view of Drew.

Claim Objections

Claims 1-8 and 12-17 have been objected to because of informalities. Applicants submit claim 7 and 12, as amended, overcome the above objections. As such, Applicants respectfully request that the objection to claims 7-8 and 12-17 be removed.

Claim Rejections under 35 U.S.C. § 112

Claims 2, 3, 12, and 13 have been rejected under 35 U.S.C. § 112, first paragraph because the Office Action states that the claims contain subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Applicants assert that capacitance between any two conductive elements will always be determined by the following basic formula: the Dielectric Constant of the material times the number of plates of the capacitor times the area of the plates all divided by the distance between the plates. This formula is always true whether you are discussing interwinding capacitance between windings of a transformer, interwinding capacitance between windings of a telephone load coil, capacitance between terminals of a transistor, or capacitance between human being and a power line. The Grossner transformer text book reference submitted by Applicants expresses this same concept in slightly different words. "The basic procedure begins with a calculation of the interface capacitance C1 between one pair of layers see (Fig. 9.8a). This capacitance is a function of the d-c or static, capacitances Co (see Fig. 9.8b) between layers which are treated like plates of a capacitor.

$$Co = \frac{\acute{\varepsilon}\underline{W_L \lambda}}{d_1}$$

Where Co is capacitance, $\acute{\varepsilon}$ is the average relative dielectric constant of the insulation, $\underline{W_L \lambda}$ is the number and area of the windings, and d_1 is the spacing between layers. (Grossner, P225-P226) Thus, capacitance, whether interwinding or otherwise is determined by the following basic formula: the Dielectric Constant of the material times the number of plates of the capacitor times the area of the plates all divided by the distance between the plates.

Moreover, the Applicants submit a reference titled "Transformer General Parameters for Telecom Magnetic Component" to further define one skilled in the art's understanding of interwinding capacitance. The Transformer General Parameters for Telecom Magnetic Component reference expressly states, "The interwinding capacitance is affected by the dielectric material between the windings, the surface area and the distance between windings." (See Transformer General Parameters for Telecom Magnetic Component, Page 1). Thus, the factors of how to determine an interwinding capacitance are known to one skilled in the art.

Similarly, how to determine a ratio between two values is known to virtually everyone. The first value is compared to the second value. The total capcitance value of two capacitors in electrically connected in parallel is determined by the following formula. The effective combined capacitance value Capacitance total = the capacitance value of the first capacitor plus the capacitance value of the second capacitor.

As such, Applicants respectfully submit that that the § 112, first paragraph rejection has been overcome.

Claim Rejections under 35 U.S.C. § 102(e)

Claims 1, 4, 6, 9, and 10 have been rejected under 35 U.S.C. § 102(e) as being anticipated by Drew. Applicant respectfully submits that independent claim 9 is patentable over the cited reference. Applicant reserves the right to swear behind the Drew reference at a later time. Claim 9 recites:

> A load coil, comprising:
> a first inductor including a first winding and a first core, the first winding having upstream and downstream ends and a first intra-winding capacitance;
> a second inductor including a second winding and a second core, the second winding having upstream and downstream ends and having a second intra-winding capacitance;
> <u>a first capacitor disposed between the upstream end of the first inductor and the downstream end of the second inductor</u> to offset at least a portion of the first and second intra-winding capacitances for improving the impedance of the load coil to DSL-band signals; and
> <u>a second capacitor disposed between the upstream end of the second inductor and the downstream end of the first inductor</u> to offset at least a portion of the first and second intra-winding capacitances for improving the impedance of the load coil to DSL-band signals.

(emphasis added).

The Office Action states:

> As shown in figures 2-4, Drew discloses a load coil, comprising:
> (4) regarding claims 9 and 10: A load coil, comprising:
> a first inductor (see figures) including a first winding (42) and a first core (see figures), the first winding having upstream and downstream ends (see figures) and a first intra-winding capacitance (C_w);
> a second inductor (see figures) including a second winding (44) and a second core (see figures), the second winding having upstream and downstream ends (see figures) and having a second intra-winding capacitance (C_w);
> a first capacitor (46) disposed between the upstream end of the first inductor and the downstream end of the second inductor to offset at least a portion of the first and second intra-winding capacitances for improving the

> impedance of the load coil to DSL-band signals (abstract and column 1, lines 41-48); and
> a second capacitor (48) disposed between the upstream end of the second inductor and the downstream end of the first inductor to offset at least a portion of the
> first and second intra-winding capacitances for improving the impedance of the load coil to DSL-band signals (abstract and column 1, lines 41-48).

(Office Action, 7/6/04, pg. 5).

Applicant respectfully traverses the examiner's position. The load coil disclosed in Drew electrically and physically differs in structure than the load coil recited in claim 9. Drew discloses a capacitor connected in parallel to a winding. Drew discloses:

> The device further has a capacitor connected in parallel across each winding. The values of the capacitors are chosen to provide a low impedance path that bypasses the windings for frequencies in the range of 20 kHz to 1.1 MHz

(Drew, Abstract, emphasis added).

> A capacitor 46 having a capacitance of C_{tc} is connected in parallel across the first winding 42, and another capacitor 48 also having a capacitance of C_{tc} is connected in parallel across the second winding 44.

(Drew Col. 3, Lns. 12-15)

Drew discusses and illustrates the interwinding capacitance of the windings. (Drew, Figures 2, 4, and 5 labeled C_{ic}, Col. 2, Ln. 24 - Col. 3 Ln. 20.) However, Drew discloses and teaches to place a capacitor (C_{tc}) in parallel to the winding (L_{choke}) and to choose the value of the capacitor relative to the inductance value of the winding that the capacitor shares a parallel relationship with. Drew discloses:

> The values of the inductance L'_{choke} and capacitance C'_{tc} are 7.5 mH and 100 nF, but they could be in the ranges of 2.5 mH to 10 mH and 50 nF to 200 nF, respectively.

(Drew Col. 3, Lns. 12-15)

Thus, Drew does not teach or suggest a capacitor to electrically connect in parallel with the inter-winding capacitance between the first inductor winding and the second inductor winding. Drew teaches by schematically illustrating that the inter-winding capacitance between the inductor windings exists but teaches away from such a limitation. In contrast, Drew discloses and teaches to place a capacitor (C_{tc}) in parallel to the winding (L_{choke}) and to choose the value of the capacitor relative to the inductance value of the winding the capacitor shares a parallel relationship with. Thus, Drew does not teach or suggest connecting "a first capacitor disposed between the upstream end of the first inductor and the downstream end of the second inductor." Similarly, Drew does not teach or suggest connecting "a second capacitor disposed between the upstream end of the second inductor and the downstream end of the first inductor." Therefore, Drew does not disclose each and every element of claim 9. As such, claim 9 is not anticipated by Drew. Claim 10 depends upon and includes the limitations of claim 9. Accordingly, claim 10 is not anticipated by Drew.

Claim 11 has been rejected under 35 U.S.C. § 102(e) as being anticipated by Shenoi et al. Applicants respectfully submit that claim 11 is patentable over the cited reference. Applicants reserve the right to swear behind the Shenoi reference at a later time. Further, Applicants reserve the right to remove Shenoi as a reference since the earliest priority date this application claims benefit of a provisional application (Feb. 23, 2000) earlier than any Shenoi can claim benefit of. Claim 11 recites:

> A DSL repeater for improving transmission of POTS band and DSL band signals over a local loop, the repeater comprising:
> an upstream signal amplifier for amplifying upstream DSL signals;
> a downstream signal amplifier for amplifying downstream DSL signals; and

> a load coil disposed in parallel with the upstream and downstream signal amplifiers for improving the transmission of POTS band signals over the local loop, wherein the load coil having one or more capacitors electrically connected in parallel with an inter-winding capacitance between windings of the load coil.

(emphasis added).

The Office Action states:

> As shown in figures 4-5, Shenoi et al. discloses a OSL repeater for improving transmission of POTS band and OSL band signals over a local loop, the repeater comprising:
> an upstream signal amplifier (AMP-U) for amplifying upstream DSL signals;
> a downstream signal amplifier (AMP-D) for amplifying downstream DSL signals; and a load coil disposed in parallel with the upstream and downstream signal amplifiers for improving the transmission of POTS band signals over the local loop (column 7, line 47 -column 9, line 45).

(Office Action, 7/6/04, pg. 5-6).

Applicants respectfully assert that Shenoi does not disclose a load coil having one or more capacitors electrically connected in parallel with an inter-winding capacitance between windings of the load coil. As such, Shenoi does not anticipate independent claim 11. Claims 12-18 depend upon and include the limitations of claim 11. Accordingly, claims 12-18 are not anticipated by Shenoi.

Claim Rejections under 35 U.S.C. § 103(a)

Claims 12, 17, and 18

Claims 12-18 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Shenoi et al. in view of Drew. However, neither Drew or Shenoi teach or suggest a load coil having one or more capacitors electrically connected in

parallel with an inter-winding capacitance between windings of the load coil. Drew in fact teaches away from placing a capacitor in parallel with the interwinding capacitance of a load coil. Thus, claims 12 -18 are patentable over the combination of Drew and Shenoi.

Claims 2, 3, 5, 7, and 8 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Drew.

Claim 7 recites:

> A load coil, comprising:
> a coupled inductor having an inter-winding capacitance, an intra-winding capacitance, and an inductance;
> the ratio of the inter-winding capacitance to the intra-winding capacitance being in the range of about 0.75 – 1.25 for increasing the impedance of the load coil to signals in the range of 25 kHz – 1.1 MHz.

(emphasis added).

Claim 8 recites:

> The load coil according to claim 7, wherein the ratio of the inter-winding capacitance to the intra-winding capacitance is in the range of about 0.99 to 1.01

(emphasis added).

The Office Action states:

> Regarding claims 2, 3, 7 and 8, although Drew doesn't specifically disclose the ration of the inter-winding capacitance and intra-winding capacitance is in the claimed range, such limitation are merely a matter of design choice and would have been obvious in the system of Drew. Drew teaches the values of the interwinding capacitance and the intrawinding capacitance depends the value of the inductance, the gauge of wire used in the windings and their physical geometry. Furthermore, Drew teaches the capacitance of the loading coil effects the frequency response of the line. In order to provide a relative flat frequency response in the voice frequency band and a decrease in attenuation in the high frequency response for providing ADSL type service, one skilled in the art has to select required interwinding and intrawinding capacitances. The limitations in claims do not define a patentably distinct invention over that in Drew reference since both the

> invention as a whole are directed to decrease the attenuation in the high frequency. The values of the capacitances of the windings depend on the required application, so long as the impedance of the loading coil to a range of frequency meets the requirement. Therefore, to select the ratio of the interwinding capacitance and the intrawinding capacitance would have been a matter of obvious design choice to one of ordinary skill in the art.

(Office Action, 7/6/04, pg. 7-8).

Applicants respectfully traverse the examiner's assertions. If a reference does not recognize that a relationship exists between two components, such as the interwinding capacitance and the intrawinding capacitance of the load coil, then the reference cannot teach using that relationship between those components to achieve a desired result without the aid of inappropriate hindsight after reading applicants own patent application. Further, since Drew does not teach about the interwinding capacitance and the intrawinding capacitance relationship, Drew does not teach about modifying that relationship by adding additional capacitors to the load coil.

Applicants submit new claims 19-21 are patentable in view of Drew and Shenoi.

Double Patenting

Claim 1 is provisionally rejected under the judicially created doctrine of double patenting over claim 7 of co-pending Application No. 09/819,158. Applicants submit a terminal disclaimer to overcome the above rejection.

Conclusion

It is respectfully submitted that in view of the amendments and remarks set forth herein, the rejections have been overcome. Applicants respectfully request allowance of claims 7-21. If there are any additional charges, please charge them to our Deposit Account No. 02-2666. Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Respectfully submitted,
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